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Assessing the acceptability of an adapted preschool obesity prevention programme: ToyBox-Scotland

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Abstract

Background: Childhood obesity is a global public health issue. Interventions to prevent the onset of obesity in the early years are often implemented in preschool settings. The ToyBox intervention was delivered across Europe and targeted energy balance-related behaviours in preschools and children's homes through teacher-led activities and parental education materials and was adapted for use in Scotland. This study assessed the acceptability of the 18-week adapted intervention to both parents and teachers.

Methods: Mixed methods were employed to collect both qualitative and quantitative data. Preschool staff and children's parents/caregivers completed post-intervention feedback surveys, from which acceptability scores were calculated and presented as proportions. Focus groups were conducted with preschool staff, whereas parents/caregivers participated in semi-structured interviews. A thematic analysis was applied to qualitative data following the development of a coding framework. Quantitative and qualitative data were analysed using SPSS and NVivo 10, respectively.

Results: Preschool staff rated the intervention as highly acceptable based on post-intervention feedback surveys (80%; mean score 8.8/11). Lower acceptability scores were observed for parents/caregivers (49%; 3.9/8). Nine preschool practitioners participated in focus groups (n = 3). User-friendliness of the intervention materials, integration of the intervention with the curriculum, and flexibility of the intervention were identified as facilitators to delivery. Barriers to delivery were time, insufficient space, and conflicting policies within preschools with regard to changing classroom layouts. Parental interviews (n = 4) revealed a lack of time to be a major barrier, which prevented parents from participating in home-based activities. Parents perceived the materials to be simple to understand and visually appealing.

Conclusions: This study identified a number of barriers and facilitators to the delivery and evaluation of the ToyBox Scotland preschool obesity prevention programme, which should be considered before any further scale-up of the intervention.

KEYWORDS
childhood obesity, intervention acceptability, mixed methods, physical activity, sedentary behaviour

1 | INTRODUCTION

Addressing the high levels of childhood obesity is a major priority in public health research and practice internationally (WHO, 2006). Preventative efforts in the early years is of particular importance (Han, Lawlor, & Kimm, 2010; Reilly et al., 2005). However, interventions to prevent obesity in preschool-aged children have produced mixed results to date (Brown et al., 2019; Fitzgibbon et al., 2006; Reilly et al., 2006; Sacher et al., 2010). One such intervention, Toybox, has recently been tested in six countries in Europe (Manios, 2012) and involved classroom and home-based activities, which targeted physical activity (PA), sedentary behaviour (SB), eating/snacking, and water consumption. The results show that Toybox has a positive impact on some energy balance-related behaviours and, importantly, does not lead to intervention-generated inequalities (De Craemer et al., 2014; De Craemer et al., 2015; Latomme et al., 2017; Pinket et al., 2016). The authors of the present paper, some of whom were also involved with the original Toybox study, have adapted the intervention for Scotland (Malden et al., 2018) and have conducted a feasibility cluster randomized controlled trial (cRCT) of Toybox-Scotland in Glasgow.

Traditionally, evaluations of complex interventions such as Toybox-Scotland have focused on effectiveness outcomes (e.g., difference in change in weight-related outcomes between intervention and control group), with the assessment of feasibility and acceptability typically limited or lacking in such studies (Fitzgibbon et al., 2011; Østbye et al., 2012; Reilly et al., 2006). This is despite the fact that the importance of assessing feasibility and acceptability within a rigorous process of development and evaluation of a complex intervention is recommended by the UK's Medical Research Council (Moore et al., 2015). Additionally, although more recent studies have assessed components of feasibility and acceptability (Griffin et al., 2014; Langford et al., 2019), such studies rarely use multiple data collection methods to achieve data triangulation, instead opting to exclusively use questionnaires or interviews/focus groups (Barber et al., 2016; Pinket et al., 2016).

The aim of this study was to assess the acceptability of the Toybox-Scotland intervention and a number of outcome measures, within a feasibility cRCT conducted in preschool settings in Glasgow. Aspects of acceptability considered here include the experience of delivering the intervention (by preschool practitioners), receiving and implementing the intervention (reported by parents), and specific experiences of outcome measurement during the cRCT. In contrast, the results relating to the feasibility of the intervention and the trial have been published elsewhere (Malden et al., 2019) and include measures of intervention fidelity, attrition rates, and compliance with outcomes measures.

Key Messages

- Preschool offer a promising environment for obesity prevention interventions to be implemented.
- Preschool staff perceived the provision of concise materials to facilitate the delivery of classroom-based physical activity sessions.
- Lack of time was identified as a major barrier to delivery of the home component of the intervention by parents.

2 | METHODS

2.1 | Methodology

A mixed methods design was employed consisting of questionnaires and logbooks, in addition to focus groups and semi-structured interviews with practitioners and parents/caregivers. Ethics approval was granted by the University of Strathclyde's School of Psychological Sciences and Health Ethics Committee.

2.2 | Setting and participants

This study was embedded within a feasibility cRCT, which was conducted in six preschools in Glasgow, United Kingdom from January to June 2018. Preschools were predominantly located within the 20% most deprived localities in Scotland. In brief, forty-two 3 to 5-year-old children were recruited to the trial, which tested the ToyBox-Scotland intervention in three preschools compared with three control (usual curriculum) preschools. The intervention was delivered by preschool practitioners in sessions within the normal preschool day. The intervention targeted PA and SB through classroom activities, changes to the classroom environment to reduce SB, and home-based parent–child activities targeting PA, SB, eating/snacking, and water consumption (Malden et al., 2018). Practitioners received a 2-hr training session prior to implementation. Details on the content and delivery of the training sessions are reported elsewhere (Malden et al., 2018).

2.3 | Recruitment

Practitioners within the three intervention preschools were invited to participate in focus groups through preschool head teachers, who

provided their staff with information sheets and consent forms. A purposive sampling strategy was used to recruit parents from the intervention preschools via practitioners who provided information sheets and consent forms for parents.

2.4 | Measures and data collection

Data collection was undertaken by one researcher (S. M.) who has extensive training and experience in conducting interviews with participants in public health intervention research.

2.4.1 | Intervention acceptability—preschool component

Preschool practitioners took part in focus groups conducted within staff rooms at intervention preschools. Focus groups were facilitated by a topic guide (Data S1), with questions exploring barriers and facilitators to delivery of the intervention and conduct of the RCT and aspects which could be improved for future implementation. Practitioners also completed post-intervention feedback forms containing a mixture of Likert scales and open-ended questions that investigated staff perceptions of the intervention and areas for improvement.

2.4.2 | Intervention acceptability—home component

One to one, semi-structured interviews were conducted with parents within a private room at the preschools. The interview topic guide (Data S2) explored parent's views and experiences of the home component of ToyBox-Scotland and barriers and facilitators to participation. All interviews were audio recorded and transcribed verbatim. Parents/caregivers were given a £25 shopping voucher as an incentive for participation. All parents within intervention preschools were provided with a post-intervention feedback survey by practitioners.

2.5 | Data analysis

Participants' responses to post intervention feedback surveys were coded using a similar approach to that employed by Verloigne et al. (2015) and Pinket et al. (2016). Specifically, positive Likert scale responses (responses of either *agree* or *strongly agree*) were coded as 1, whereas nonresponses or negative responses (*neither agree nor disagree*, *disagree*, or *strongly disagree*) were coded as 0. Dichotomous responses of *yes* or *no* were coded as 1 or 0, respectively. A total acceptability score of 11 was available for practitioner surveys and 8 for parental surveys. Proportions were calculated to give the total acceptability score as a percentage for each sample. At present, there are no specific guidelines on quantifying the level of acceptability in intervention research. Therefore, recommendations proposed by Durlak and DuPre (2008) for categorizing fidelity scoring were adopted whereby a threshold of ≥60% was classified as high acceptability (Durlak & DuPre, 2008).

Interview and focus group data were analysed using an inductive thematic analysis (Braun & Clarke, 2006). A coding framework was developed by one researcher (S. M.) using the framework approach (Ritchie, Lewis, Nicholls, & Ormston, 2013), before the coding was independently checked by another researcher (A. M. G.). Any discrepancies in the assignment of codes to text or the definition of codes were discussed and agreed upon, before codes were grouped into themes and sub-themes. Additional data from open-ended questions in practitioner logbooks and parental surveys were also added to the data set during coding. Data analysis was conducted using NVivo 10 software. Method triangulation was employed by considering the findings of both the quantitative surveys and qualitative focus groups/interviews collectively. The collection of both quantitative and qualitative data from two distinct groups (teachers and parents) regarding a specific phenomenon (acceptability of intervention components and delivery) increases reliability and validity of the findings (Carter, Bryant-Lukosius, DiCenso, Blythe, & Neville, 2014). All questionnaire data were analysed prior to the analysis of outcome data as recommended by current process evaluation guidelines (Moore et al., 2015).

3 | RESULTS

Post intervention feedback surveys were distributed to all participants of eligible children (n = 125) for which 26 were returned. Seven of these were incomplete and were excluded, leaving 19 for analysis. Nine preschool practitioners completed post-intervention feedback surveys and participated in focus groups, whereas four parents took part in a semi-structured interview. All participants were women, and all parental interviewees identified themselves as the child's mother.

3.1 | Preschool acceptability

The total acceptability score from post-intervention practitioner questionnaire responses was 80% (mean score 8.8/11), indicating that acceptability of the intervention was high. Based on the focus group findings, 4 themes and 20 sub-themes were identified relating to intervention acceptability, barriers, and facilitators to implementation, which are detailed below.

3.2 | The need for obesity prevention interventions in Scottish preschools

3.2.1 | Increasing opportunities

There was a consensus that interventions such as ToyBox Scotland were needed in Scottish preschools. Practitioners cited high levels

of childhood obesity, increasing use of screen devices, and a lack of access to opportunities to engage in healthy behaviours as a rationale for the programme.

> My initial thoughts were it would be good for the children because a lot of our children live in high rise flats and they don't have much time to go out and play. Also, in society today, parents are afraid to let their children out to play. So, there's less physical activity again and a lot of children are hooked to their phones and their iPads and things. So, I thought it was good for the children.

3.2.2 | Aligning with preschool and government health objectives

A major asset of the ToyBox programme was that it enabled preschool staff to meet health and well-being curriculum targets in the Scottish education system. Practitioners stated that they could easily match ToyBox activities to the Scottish curriculum for excellence's experiences and outcomes (Education Scotland, 2017).

3.3 | Acceptability of the intervention

3.3.1 | Practitioner perceptions of intervention content and materials

In general, practitioners found the intervention to be acceptable and feasible to deliver. A number of barriers and facilitators to implementation were identified and discussed. Specifically, the classroom materials and activity guides were perceived to be a useful resource, which made the delivery of physical activity sessions easier by reducing the need for prior planning.

> I think because it gave me something to do and something to plan for, that it was all organised, and then I was not stressed. I was like that's it; this is what I'm doing and this is it, you know, it's all planned out for you.

All participants agreed that the classroom materials were visually appealing, used appropriate language, and provided clear, concise instructions, which aided the delivery of the programme.

> I think they're quite easy to use [classroom activity guides] because they're step-by-step and obviously, you've got a picture to represent as well. Some of us need that. Like, what is this we're doing? But also, it tells you everything you need.

Practitioners also felt that the classroom activity guides allowed flexibility in delivery, and PA sessions could be easily adapted to suit the context of the specific preschool.

> I like it because it gives you a base for stuff as well. So, we can do the wee chiffon cloth game but we can also make it a bit different and we can try different things with it. So, we can adapt it as well and make it harder, give more of a challenge or we can scaffold it. We can do different things with them all.

There were mixed feelings about making changes to the preschool environment. Some participants were against the idea, to begin with, but accepted it once changes were made.

> I mean, initially, when we were talking about losing chairs and that kind of thing, I was a bit apprehensive about it because you get used to what you're used to. But, you know, since making the changes, it's been good.

3.3.2 | Parent and child perceptions

A number of practitioners reported receiving feedback from parents regarding both the changes implemented in the preschool and the parent–child activities provided as part of the intervention. However, others stated that they received no feedback from parents. In general, parental feedback was positive and focused on how the home component of the intervention had benefited them.

> A lot of parents have been coming back and saying it gave them ideas and useful things to do when they were going out and at the weekend. It was things that they could do that didn't cost any money.

Practitioners at one preschool stated that although they did not receive any direct feedback from parents, children told the practitioners that they were engaging with the home materials with their parents.

> Some of them were saying they were doing it and if we were talking to the children, they were saying they were doing it, but getting any kind of evidence, we didn't get a lot of evidence. But verbally, children would say they were doing the games with mum or dad.
>
> Practitioners believed that the children enjoyed the preschool-based component of the intervention, based on children's reactions and asking to do specific activities again.

3.3.3 | Practitioner training

Participants found the pre-intervention training session to be informative and sufficient to allow them to implement the intervention in the preschool.

> I think it was fine. It was all explained and the handbooks are really quite self-explanatory and I think the staff found them easy to use as well.

3.4 | Level of implementation

The intervention was implemented with high fidelity across the three preschools (Malden et al., 2019, results published separately). However, practitioners highlighted a number of barriers and facilitators to implementation of specific intervention components.

3.4.1 | Environmental changes to the classroom

The level of environmental change varied between each preschool. One preschool did not remove any chairs from the classroom and cited a lack of space and conflicting preschool policy as the reason.

> We didn't [remove chairs] purely because we've got a new head teacher in place and he was trying to set up the environment in different ways before he introduced any of these programmes. What's happened is, we've actually got less space to move around. I think the new head teacher is looking at ways to reduce the children running around the playroom.

The remaining two preschools did remove chairs, which offered and was perceived to offer more space for children to be active. One preschool also adopted an open door policy, giving children the freedom to go outside.

> There was taking away the chairs and giving them more space, and then we changed that making it an open door policy out here … There's more floorspace for them to extend their playing as well.
> At the art area as well, there's less sitting down painting.

3.4.2 | Mode of delivery

The way in which practitioners delivered the intervention differed slightly between preschools. All practitioners stated that they delivered the programme indoors and outdoors, weather permitting. However, one preschool only delivered PA sessions in the gym hall and did not utilize the classroom. Most practitioners stated that they did not deliver sessions from start to finish, instead they split sessions up throughout the day.

> See the warm up games? They were kind of most popular. The kids, kind of enjoyed them quite a lot like fire, water, storm. They really enjoyed that, and you don't need any resources for that. So we would start with those and do the rest later.

Practitioners generally agreed that children were able to participate in the sessions with minimal instruction. This was seen as a benefit, as child-led learning is encouraged as part of the Scottish preschool curriculum.

> We didn't need a member of staff there; the kids were just wanting to do it themselves. They sometimes take it their own way as well, with their own wee bits and pieces which was nice to see.

3.4.3 | Sedentary behaviour

Movement games that aimed to break up sedentary time were implemented with less fidelity across all three preschools than the PA sessions. However, movement corners were set up within the preschools, with a number of practitioners stating that they created their own movement corners, which were not in the manuals.

> We have made more cosy areas for children to just go and chill out. The book corner's a little bit bigger, so they can jump around or chill out

Practitioners were more conscious about when children were sitting down and used the SB activities to break up sitting time.

> Yes, rather than sitting the kids down we've got them to stand stretching and things.

Conversely, some practitioners felt a number of the SB activities did not work so well, as children would lose interest, or instructions and props were insufficient; however, they were able to adapt these and make them more engaging.

> But I think she had difficulty in following the story without pictures or props. I think it was just the story and the book but there were no kind of pictures to go with it. So, she said once she introduced the props and it was kind of simplified, the children engaged and they enjoyed the role play with the puppets and searching around the garden.

3.4.4 | Physical activity sessions

Practitioners generally enjoyed delivering the PA sessions, and this was reflected in the level of implementation in comparison to the SB activities.

> The cardboard rolls one we did. Barefoot land, she's [another practitioner] done that twice. Because she spoke about that one in the staff room and she said that the children really enjoyed that. It was a bit different. We've never really done anything like that, and I think that was fab.

3.4.5 | Barriers to delivery

In general, the intervention was perceived to be simple to deliver; this was facilitated by easy-to-use resources and the programme offering flexibility for delivery. Barriers to delivery were preschool specific and were mainly related to logistical issues such as a lack of time and space in one preschool.

> Probably just not having the physical space all the time. We've only got the gym hall, the use of the gym hall and weather permitting. We're outdoors every day no matter what the weather but depending on the weather, it's sometimes hard to carry out the physical activities because we've only got one playroom.

3.5 | Trial procedures

3.5.1 | Acceptability of trial procedures

Overall, practitioners felt that the trial procedures to measure the feasibility of the ToyBox study were acceptable, and the time taken to conduct data collection was manageable. However, a major issue highlighted by all participants was the acceptability of the activPAL accelerometers. Although it was felt that children enjoyed wearing the devices, practitioners agreed that they were overly invasive and that parents did not find them acceptable for a number of reasons, including skin irritation.

However, all practitioners stated that alternative devices (e.g., wrist- or ankle-worn accelerometers) would be more practical for this group and would be more acceptable to parents.

> I think it's still good though if you still use a tracker of some sort, but maybe… Or like these wee watches. They're great.
> Yes, I'm thinking more like a wristband-y thing might be better. Or put them on their ankle or something and it can stay on there.

Parental response rates to questionnaires were low in the trial, and practitioners attributed this to parents being too busy or lacking the reading ability to complete the questionnaires.

> Some parents actually physically can't read. And things that are coming home from school on bits of paper is linked to actual primary school, and parents will just put it to the side and you have to keep chasing them up and chasing them up which we've found for your questionnaires.

All practitioners found the monthly activity logbook, which was used to measure fidelity, to be acceptable and time efficient to use.

3.5.2 | Trial recruitment

Practitioners at two of the preschools stated that they actively engaged with parents during study recruitment, which they felt aided recruitment.

> I stood at the door and I was like, so this is what we're doing and …, just sign here. And I did explain fully what it was about and the impact that it would have. I was really keen.

Practitioners offered a number of suggestions to increase recruitment rates. Specifically, having more face-to-face interactions between the research team and parents and the use of social media.

> I think if you can meet them [parents] and explain the benefits that it will have in front of the parents, and then if they see an actual outcome, an impact for their child and their family, then they tend to go with that.

3.6 | Home acceptability

Acceptability scores from parental post-intervention feedback surveys totalled 49% (mean score 3.9/8), indicating low acceptability. Table 1 summarizes the parental responses to each acceptability item on the survey. Items relating to acceptability of materials and activities (Items 1, 2, 3, and 8) were higher than items relating to the perceived effect of the intervention on health behaviours (Items 4–7). Results of semi-structured interviews are presented below.

3.7 | Acceptability of intervention materials

3.7.1 | Parental perceptions of materials and activities

Parents generally found the materials to be visually appealing. The length of the activity packs was deemed appropriate, and the language was easy to understand, and instructions were easy to follow.

TABLE 1 Acceptability scores per item for parental feedback surveys

Item number	Survey question	Percentage coded as 1 (*agree/strongly agree*; %)
1	Overall, did your child enjoy the activities in the programme?	84
2	Overall, did your child like the stickers and wallchart provided?	79
3	Did you enjoy doing the activities with your child?	58
4	Do you think the activities helped your child be more physically active?	37
5	Do you think the activities helped your child spend less time sitting/being inactive?	21
6	Do you think the activities helped your child eat healthier snacks?	21
7	Do you think the activities helped your child drink more water instead of sugary juices?	16
8	Were the instructions provided for the games and activities easy to read and clear	79

> I quite like them visually [the materials], like for me; like I'm not quick, so I need to read things over, like just to make sure it goes in again. But no, I think it's quite visually … nice, and easy to make sense of what was being said.

Two of the parents stated that they enjoyed engaging in the activities with their child, whereas the remaining two stated that they did not use the activities enough to form strong opinions.

> I can't remember in detail like each one, but to me they looked fine and the stickers and poster were really nice, he did really like them like I said good visuals and that. Can't think of anything right now to be honest, like I said its more just the time that was a problem, think as a single parent it's not that easy to do everything, you know.

3.7.2 | Parental recognition of obesogenic behaviours

Parents stated that while they may not have utilized the suggested activities fully, the materials stimulated their thinking about obesogenic behaviours and to what extent their child is engaging in PA, screen time, and healthy snacking. With regards to knowledge, parents generally did not feel that they learned anything new through receiving the materials.

> It kind of got me thinking a bit more about what he's doing like for keeping active and that. And I'd say Im pretty good with watching what he eats and drinks and stuff, so not really on that side, but I did think a bit more about keeping him active.

3.7.3 | Child perceptions

All parents stated that their children enjoyed the activities, and the stickers and accompanying materials were well received by the children according to the parents.

> They had nice wee sketches on them, my kids really liked the stickers as I said. She's at that age where stickers are really good.

3.8 | Level of implementation

As highlighted in the parental survey results, parents stated that they did not implement the programme fully. All stated that they implemented some of the activities but were mainly limited by time constraints and other commitments.

> I would just say, when the packs came out, we would try the odd activity. I never got a chance to do all of them, as I say, due to personal circumstances. I … would just go through them with him and let him choose what one he wants to do.

An important facilitator identified by two parents was that children would prompt them to implement the activities, sometimes due to reinforcement from preschools.

> As any busy mum working full time, you get to a point at night and go, oh, and try and get the activities done; but he was actually really good at prompting, because in the background the nursery must have been highly speaking about it; so he'd go, Mu-um, activities; and I'm like, oh, again

3.8.1 | Use of sticker incentives and wallchart

Parent's implementation of the sticker incentives and accompanying wallchart varied. One parent used the wallchart as intended, awarding a sticker to their child once an activity was complete.

The remaining participants used the stickers more loosely; one participant did not use the wallchart but still gave the stickers to her child. Two parents stated that their children stuck the stickers to their clothes instead of the chart. All participants felt that the stickers were an effective incentive for influencing their children's behaviour to an extent.

> I think it was really good and really engaging, because the way it's laid out, like for me it wasn't difficult, it really wasn't difficult to understand; [child's name] got it; and as and when you're putting your stickers on, obviously because it matches and colour coordinated he knew, he could do it; he says, like, we've done that one, we did this. It was really good.

3.8.2 | Use of activities

In general, parents perceived their overall use of the materials to be low. The main barrier identified to participation was time constraints.

> Mainly just time. I work shifts and my partner does too, so we have the three of them and between getting them fed and bathed and that, school, nursery, and all that. There would be times I'd get the packs and have a look at them and go like "ok I'll give that a try" but then never get around to it.

Parents recalled specific activities that they did implement, and their children's reactions to these.

Now he's more into water as well; so, it was just trying to … He was measuring himself [measuring water consumption] just to make sure, like he'd get up in the morning and go like, oh, like straightaway. Which was really good. It was more it made him more aware.

3.9 | Trial procedures

3.9.1 | Acceptability of accelerometers

Three of the four parents were involved in the cRCT, and their children wore the accelerometer during the study. They offered insights regarding the device's acceptability. Specifically, although the children liked wearing the device, parents generally felt a wrist-worn device would be more acceptable and would encourage more parents to give consent for their child to participate in the study. One parent stated that their child developed a mild rash when wearing the activPAL.

It could be like Fitbits, but they don't take them off at night. Think they are a bit less hassle and people would be less bothered by them.

4 | DISCUSSION

This study investigated the acceptability of the ToyBox Scotland obesity prevention intervention in preschools and children's homes. By using a mixed methods design, important aspects of intervention acceptability were identified that will assist with further development of the programme within Scottish preschools. Post intervention practitioner survey results suggested that the intervention was highly acceptable (80% acceptability score). This was reinforced in the qualitative findings, as practitioners identified a number of aspects of the intervention that aided delivery, namely, user-friendly and informative classroom manuals, the programme being well aligned with preschool health and well-being curriculum objectives, and not overburdening staff with additional responsibilities or paperwork. Similar studies have highlighted time-consuming paperwork and additional workload as major barriers to intervention acceptability (Alhassan & Whitt-Glover, 2014; Whitt-Glover & Porte, 2013). Therefore, it appears that the extensive involvement of stakeholders during intervention development (Malden et al., 2018) has benefitted the acceptability of the intervention in Scottish preschools, a finding reported by similar studies that have actively involved practitioners during intervention development (Howie et al., 2014).

One aspect of the intervention that was highlighted as more difficult to implement by practitioners was changing the classroom environment, which specifically aimed to reduce sitting time and encourage more active play. A related issue was the disparity between the level of implementation of movement breaks in comparison with physical activity sessions. A possible explanation for this is provided in a study by Alhassan and Whitt-Glover (2014)) of a teacher-led preschool physical activity programme. Specifically, teachers incorrectly assumed that the classroom needed to be rearranged for each movement break, which discouraged regular implementation. Additionally, teachers also highlighted a need for more training regarding movement breaks (Alhassan & Whitt-Glover, 2014). Indeed, practitioners in our study stated that prior to receiving the classroom activity guides, their confidence was low with regards to delivering classroom PA but increased following training and the provision of classroom activity guides. Therefore, additional training on how best to incorporate movement breaks into the preschool routine, without disrupting other activities, may be of benefit in the future.

The acceptability of the home component of the intervention was lower (49% acceptability score) than the preschool component (80% acceptability score) based on parental survey responses, with the qualitative findings offering further explanation for this. Specifically, a major barrier identified during interviews was limited time to participate in the activities. This is a barrier commonly identified in family-based obesity prevention studies (Berge, Arikian, Doherty, & Neumark-Sztainer, 2012; Staiano et al., 2017). It was apparent that parents did not perceive the intervention to have had any major effect on health behaviours possibly due to them feeling that they were not able to participate in activities fully based on the aforementioned barriers. However, parents had positive perceptions of the materials and activities concerning child enjoyment, acceptability of sticker

incentives, and legibility of activity instructions, indicating that the lack of acceptability is likely an issue with method of delivery, rather than the content of materials. The Miranos study by Sosa, Parra-Medina, He, Trummer, and Yin (2016) utilized a more engaging delivery approach, whereby parents were invited to short information sessions at their child's preschool, which were led by trained parents who acted as peer educators. Sessions were offered at multiple time slots, provided appealing visual materials and offered incentives for participation. The intervention achieved high attendance rates (mean attendance = 80%) and resulted in significantly increased parental knowledge of obesity-related health behaviours (Sosa et al., 2016), indicating that such approaches may be more effective than solely distributing intervention materials to the home.

Both parents and practitioners offered extensive insights on acceptability of the trial procedures. Specifically, the activPAL accelerometer was perceived as invasive and caused a mild rash in some children, a finding supported by another study with preschool children (De Decker et al., 2013). Wrist-worn devices were regarded as a viable alternative by both parents and practitioners, with such devices having previously been shown to provide similarly valid estimates of physical activity and sedentary behaviour in comparison with the activPAL; however, these devices do not provide postural data, and their accuracy varies (An, Kim, & Lee, 2017; Koster et al., 2016).

Recruitment to the feasibility RCT was somewhat low (18%); therefore, practitioners were asked how best to engage parents to participate in future research. It was strongly suggested that having face-to-face interactions with parents, and providing information sessions as opposed to only distributing forms, was the most productive approach to take. This supports findings from a systematic review of childhood obesity prevention recruitment strategies, where higher recruitment rates were achieved than in the present study by using additional approaches such as parental presentations, phone calls, or home visits (Cui, Seburg, Sherwood, Faith, & Ward, 2015).

There are a number of limitations to this present study, which should be considered when interpreting the findings. Firstly, recruitment of parents to take part in interviews was low and only included mothers. This may have biassed results, as the parents who participated in the interviews may have had stronger perceptions of the intervention in comparison with parents who did not participate. Additionally, fathers may have offered differing perspectives regarding intervention acceptability compared to mothers. Recall bias is also a potential limitation within this study, as the focus groups and interviews took place approximately 2 months after the intervention had ended. Despite the limitations identified, these findings offer insight regarding the acceptability of ToyBox Scotland, which can be used to further develop and adapt the programme before any future evaluation and may assist the development of similar interventions.

The ToyBox Scotland intervention appears to be acceptable in the preschool environment, based on the perceptions of preschool practitioners. Further development and adaptation measures are needed to improve the acceptability of the home-based component. Specifically, a new approach to intervention delivery in the home environment may be needed. Further development work with both parents and preschool practitioners will assist with optimizing intervention content and delivery and should be a priority before progression to further implementation and evaluation. The employment of feasibility and acceptability studies allows for the identification of issues with intervention acceptability. Such studies should be more widely used within intervention development and evaluation research.

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CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

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